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ABSTRACT

Teachers have been identified as the critical change agents in integrating technological instructional materials with teaching and learring styles and with classroom activities. However, many teachers do not understand the changes in their roles in a technology intensive classroom, nor do they have the proper training to use new educational technologies. Answers to these problems may be found in both preservice and inservice teacher education, the latter in the form of workshops and summer institutes after initial certification so that a maximum level of professional competence may be attained. Some problems with staff development, however, are lack of equipment, funding, and the use of quick intervention techniques in answer to the long range problem of technology integration into the classroom. In response to these problems, computer companies, corporations, and state departments of education have found ways to aid in training efforts by providing money, equipment, and leadership. However, individual teachers, administrators, state officials, publishers, training institutions, and private corporations must all continue to search for effective means of transferring technology into the classroom of the 90's. (DB)

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PREPARING TEACHERS FOR TECHNOLOGY IN THE 90's: VIEWS FROM THE TOP

by

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Preparing Teachers for Technology in the 90's: View from the Top

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Abstract. A recent symposium entitled *The View from the Top: A Symposium on Education and Publishing in the 1990's* was sponsored by the Tandy Corporation of Fort Worth, Texas. Participants included seven state school superintendents and the chief operating officers of seven major book publishers. These individuals shared in a discussion focused on two basic themes: (1) political and social issues in integrating new information technologies into the educational system, and (2) technical difficulties in integrating new information technologies into the educational system. This paper addresses one of their concerns and attempts to synthesize many of their solutions.

One of the major outcomes of the conference was the explicit identification of *teachers* as the critical "change agents" to accomplish a technology transfer from traditional print-based materials to other technology media. The critical deficiency in this process was a lack of teacher training to use new technology. This paper describes steps which might be taken to remediate this deficiency. Specifically, the paper outlines training and staff development needs, the process of involving teachers, programs which might be implemented for large-scale training efforts, and funding mechanisms. In addition, exemplary state plans are reviewed. A series of recommendations which would facilitate the technology transfer process are offered as well.

Background. Increased numbers of computers and related technologies are designed to solve problems of student access and equity in the classroom of the 90's. How to effectively implement new technology to promote learning, however, remains a critical concern. Tools alone do not guarantee better learning or increased motivation for students. Consider the promise of the "teaching machine" of the late 1950's. A similar rhetoric of change was applied to this technology three decades ago with no discernable difference in teaching or learning behavior. However, the implementation of this older technology systematically ignored a key player in the educational process--the teacher.

The primary link between the students, the curriculum, and new educational technologies is still the classroom teacher. Teachers must have options to choose technological instructional materials and flexibility to implement the materials according to individual teaching styles and circumstances. This process of integrating technology with teaching and learning styles requires a period of trial, error, and experimentation for classroom teachers.

Teacher Roles. Although there is a lack of systematic research on changes in teachers' *roles* in technology-intensive classrooms, a number of writers have projected their visions upon the mass media. Toffler (ref 4) uses the "teacher as manager" of learning metaphor in his writing, in which the teacher acts as a resource for students who may be learning in a school or home-based environment. Other writers refer to teachers as facilitators, coaches, guides, active participants, and enablers, working along side rather than in front

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of the students in a new learning process. The students themselves may use computers individually or in small groups, cooperatively learning and teaching each other.

The Need for Training. How can we help teachers continue to function as key figures in future classrooms, capable of adapting to changing roles and new learning opportunities? One answer is to provide more training, both preservice and inservice, and to involve teachers in decisions about technology and training.

Current studies show only half of the nation's teachers report using computers and even fewer use them regularly. Additional data shows only one third of all K-12 teachers report 10 hours of computer training, and many preservice teachers feel unprepared for teaching with computers (ref 5). Present and future teachers are not prepared for the 21st century for many reasons. Many are afraid of or overwhelmed by the technological changes in the past decade. They may not be using technology because they have not seen it modeled by either their college professors or their master teachers. Teachers must keep an open mind to continuing developments in technology or they will be "'teaching today's children to solve tomorrow's problems with yesterday's tools'" (ref 1) Borich (ref 3) has proposed a view of teacher training which encompasses four developmental steps: preteaching, preservice, induction, and renewal. This model of teacher development is displayed in Figure 1. This model assumes that certification is only the minimum level of competence for teaching. Secondly, it assumes that becoming a master teacher is an active, lifelong process of professional growth and development.

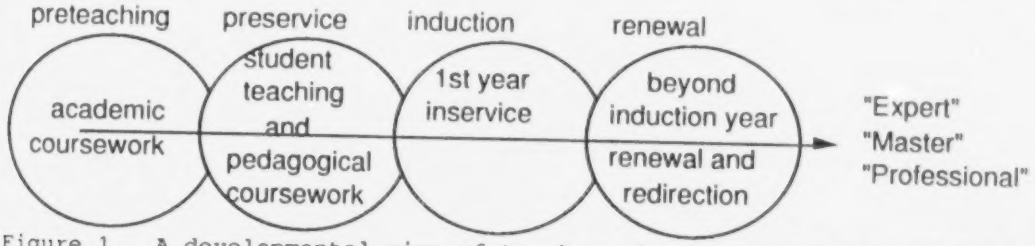

Figure 1. A developmental view of teacher education. Source: Borich in Shermis (1988).

Inservice training (e.g., after school workshops or summer institutes) is currently provided by colleges of education, school districts, regional service centers, professional organizations, vendors of hardware and software, and other private corporations. Studies of successful training indicate that effective practices include extensive hands-on practice, individualized attention, peer interaction, detailed curriculum guides and lesson plans, and lesson-related materials and handouts (ref 2).

The problems with staff development, however, are numerous. One common problem is a lack of equipment (usually computers) essential to any type of training session. Another is the short-sightedness of trying to plan a quick intervention (e.g., two or three-day workshops) to help solve the long-range problem of teachers integrating technology into the classroom. Possible solutions include (1) implementing mentoring programs in which mentors are assigned to individual preservice teachers working with them on effective instructional methods, (2) model programs used by business and industry where high-level training personnel work with employees, and (3) develop software support materials analogous to instructor's manuals for textbooks.

Direction and Funding of Training Programs. Two important questions about teacher training and staff development remain: How do federal, state, and local agencies provide training leadership? and How do such programs get funded? States must provide a key role in staff development "'to inform its districts about the possibilities of technology and to suggest avenues [for] funding possibilities and support'" (ref 1). Texas, for example has a detailed and comprehensive long-range plan implementing technology in the schools which has several sections devoted to staff development and teacher training.

Despite the inevitable lack of steady funding, several states have initiated innovative training projects. For example, New Hampshire has directed $7.5 million (U.S.) into a project called "Computers in the Classroom," which provides teachers with their own computers to take home or use in any way they want. In Minnesota, the state department of education fills requests for computers through a non-profit company--a procedure that enables them to put computers in the classroom more quickly than through the state purchasing system.

Computer companies also help training efforts in a variety of ways. For example, in earlier years, the Tandy Corporation introduced more than 400,000 teachers to computers through seminars and workshops in Radio Shack outlets. IBM, Apple, and AT&T have also offered educational discounts on equipment and developed cooperative relationships with state and local training institutions. In the future, even more innovation and cooperation will be needed for effective teacher training and staff development as training costs may exceed the costs of hardware and software (ref 2).

Individual teachers, administrators, state officials, publishers, training institutions, private corporations--all must continue to search for effective means of transferring technology into the classroom of the 90's. As more teachers are exposed to technology they will be more open to integrating it into the curriculum; as sufficient training and follow-up support becomes available, teachers will be prepared for future developments in technology.

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